

Enhancement of Sperm Motility in Assisted Reproduction

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[*Rev Urol.* 2006;8(2):88]

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One of the benefits of being a urologist who deals with male infertility issues and who has the pleasure of working at an academic institution that does not have an in-house in vitro fertilization (IVF) center is that I travel to a number of outlying IVF centers to perform sperm aspiration procedures. When one has to go into the testis itself to get the sperm, there are 2 ways of accomplishing this: 1) TESA (testicular sperm aspiration), which essentially is placing a needle into the testis and aspirating the “intra-testicular fluid”; and 2) TESE (testicular sperm extraction), which is excising testicular tissue from the testis. TESA is favored by non-urological andrologists (for obvious reasons, given that it does not involve “cutting”), and at some IVF centers TESA might be performed by an endocrinologist, a reproductive gynecologist, or even an internist interested in andrology. TESE is usually performed by the urologist. Regardless of whether TESA or TESE is used to obtain the sperm, one constant finding is that the intratesticular sperm might not be motile. The conundrum is whether the sperm are asleep or dead. The importance of this is that the use of motile sperm in intracytoplasmic sperm injection (ICSI)-IVF significantly increases the efficacy of the procedure.

As a constant visitor to a number of IVF centers, I might get a report from the embryologist after immediately passing the tissue off to him or her that there are indeed sperm in the testicular tissue but that I should get more tissue because the sperm that are under his or her microscope are not motile. The question at this point is this: Do I get more tissue (which might reveal the same finding of immotile sperm), or are there techniques to make the sperm wake up? The tests used to distinguish live from dead sperm (eg, hypo-osmotic swelling or vital staining) are not useful in this situation because these tests are harmful to those sperm.

It is known that immotile testicular extracted sperm in culture medium might develop motility with time, and for this reason some IVF centers prefer to perform TESE 1 day before egg aspiration. In the past, phosphodiesterase inhibitors (eg, pentoxifylline [PXY]), which are simply

analogues of caffeine, have been used to induce motility in sperm in men with oligospermia who were participants in intrauterine insemination procedures. Although toxicity to oocytes with PXY has been reported, there is no evidence of any toxic effects of PXY on sperm. Therefore, it becomes a simple stretch to examine whether PXY is efficacious in “waking up” testicular sperm obtained by TESA or TESE. Many TESE specimens are frozen and then thawed at the time of IVF.

Clinical Use of Pentoxifylline for Activation of Immotile Testicular Sperm before ICSI in Patients with Azoospermia

Kovacic B, Vlaisavljevic V, Reljic M.

J Androl. 2006;27:45-52.

Kovacic and colleagues attempted to address this issue by studying 77 TESA/TESE cycles in which no motile sperm were found in the specimens up to 2 hours after TESA/TESE. ICSI was performed with 30 of these 77 immotile sperm specimens, whereas in 47 specimens ICSI was performed after PXY (0.5 mg/mL) was added if motility was not seen 2 hours after extraction or thawing. PXY was added for 20 minutes only. Of the 47 specimens that had PXY added for 20 minutes, 45 developed motile sperm. Although the immotile sperm group did achieve fertilization, the rate of fertilization in the PXY group was higher (66% vs 51%, $P < .05$). The results of this study suggest that 1) PXY can be used on TESA/TESE specimens to increase sperm motility in both fresh and frozen specimens; 2) because the majority of sperm initiate motility within 20 minutes of incubation with PXY, a considerable amount of

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time is not added to the ICSI procedure by using this adjunct; and 3) fertilization rates seem to be higher when compared with the use of immotile sperm for ICSI-IVF.

Therefore, now when an embryologist asks me to get more testicular tissue because the sperm under the microscope are immotile, or if I am called to perform another TESE because the thawed specimen from a previous TESA/TESE shows no motility, I can now emphatically state “try adding pentoxifylline.” ■